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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

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1. History

a. Initial development work in the field of crystal diodes began in 1945 in the former AEG, now the Werk fuer Fernmeldewesen HF, in Berlin-Oberschoeneweide. Based upon experience gathered by Telefunken, further development of the two silicon diodes, ED 704 and ED 705, was carried out. These diodes, produced according to the Guenther process for polycrystalline silicon surfaces, were being manufactured as early as 1946-1947 and are being produced at present.

b. A number of well-known experts such as Dr. Bronder, Dr. Weiss and others were engaged with problems of gr[redacted] but these experts moved to the W[redacted] experimental plant, took over di[redacted] duties. Af[redacted] in 1951, Dr[redacted] so left the plant. He took his special assignment in the field of [redacted]ctors to this new office, the Institute for Research on Solid Materials (Institut fuer Festkörperforschung) in Berl[redacted], Dipl.-Physicist Diedrich went with him to that institute. Whe[redacted]t, the small group at the HF plant was broken up. The psychopath[redacted] chemist, Dr. Bingel, was not in a position to keep up the current production of ED 704 and ED 705. In the fall of 1952, Measurements-Technician Troeger also left the plant and went to work at the Dralowid plant.

c. This critical situation, which developed in 1951, caused anxiety within the VVB-RFT. The HF enterprise was still under Soviet management and, consequently, RFT had no authority. The entire diode production had been turned over to SAG enterprises, particularly to the Sachsenwerk-Radeberg. On this basis, Bless, (development chief of VVB-RFT) and Ing. Graul (responsible for development of structural parts) were able to induce ZAFT in December 1951 and January 1952 that the RFT-enterprise, Dralowid-Teltow, should receive the order to develop diodes and transistors.

d. A meeting was held in February 1952 which was attended by the development management of VVB-RFT, the technical staff [redacted]alowid plant headed by Dr. Falter, Bresslein and Dr. Moeglich, Dr[redacted] Dipl.-Physicist Diedrich

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from the Institute for Solid Materials Research, Dr. Buergel from the HF enterprise, and representatives of public offices. The state of development of the silicon and germanium field was explained with the help of two detailed reports from the Institute for Solid Materials Research. Guide lines for a mutual development effort were worked out. Only Dr. Buergel excluded himself from this common effort.

e. Experiments and developments were then conducted simultaneously in Busch and Teltow with silicon, only because germanium was not available. A modification of the Guenther process resulted in a relatively simple method for the production of silicon monocrystals from the vapor phase. In addition, three mechanical and stable diode designs were developed. This work was completed in March 1953. In the meantime, new furnaces for the production of monocrystals from the melt had been completed and had undergone tests. 25X

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[redacted]

f. Collaboration between [redacted] place within [redacted] fiers." Dr. [redacted] of [redacted] Graul was [redacted] was also chief of the laboratory [redacted] search at the Dralowid plant, Teltow. The last conference [redacted] for Semiconductors and Rectifiers" in which Graul took part [redacted] fested was held on 22 July 1953. Between 15 and 25 July 1953, the chief of the laboratory, Chem.-Ing. Sauer, [redacted] 25X

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The remaining professional staff of the laboratory probably consisted of Dipl.-Math. Raabe and Dipl.-Math Guerschote. Dipl.-Physicist Diedrich may also have moved to Dralowid-Teltow.

2. State of Development of Silicon Diodes

a. Modified Guenther process

(1) The separation of the silicon from the vapor phase was carried out in a quartz tube of approximately 100 millimeter diameter and 2,000 millimeter length. $SiCl_4$ in vapor form was introduced in the presence of aluminum and a temperature of more than 1,000 degrees C. Silicon was deposited, after a cooling process, in large crystal grains, some of which had a diameter of 5 millimeters. The crystal grains were large conglomerates, consisting principally of several mono-crystals, with irregular interfaces. The adhering aluminum was eliminated chemically. The purity was extraordinarily high. The specific resistance amounted to 36-38 ohm-centimeters and resulting inverse voltages amounted to 1.5 to 2.5 volts. Diodes manufactured from these crystals had current ratings up to 10 m A. In exceptional cases the ratings went up to 30 m A. The majority of the crystals obtained from one run had current ratings of 0.5 to 1 m A.

(2) On this basis a series of five diode rectifiers and two mixing diodes were set up. These differed from one another by the different current ratings and by the slope of the wave form. Sorting out was accomplished with a characteristic curve recorder. The development was considered to be technically complete.

b. Mono-crystals from the melt

(1) In April-May 1953, the first crude experiments utilizing silicon crystal

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